ADEQ
Arizona Department of Environmental Quality

Year 2005

Air Quality Division

ANNUAL AIR EMISSIONS INVENTORY QUESTIONNAIRE

For Facilities Permitted to Operate Generators

The 2005 Annual Emissions Inventory Questionnaire includes 4 forms that are required to be completed and submitted to the Air Quality Division. Instructions for each form are included below. Upon completion, submit the forms along with the signature by the Responsible Official of the facility within 90 days of receipt of a letter from the Department.

FORM 1: Facility General Information

SECTION I thru III: Complete all fields as requested.

FORM 2: Equipment & Process Data

Table 1: List all details on the generators along with the Authorization To Operate (ATO) number for all the permitted equipment. Indicate, if not available.

Table 2: Provide details of each stack.

FORM 3: Emissions Data

Based on the type of fuel used, (Gasoline, Diesel, or Natural Gas/Liquid Propane), choose the appropriate table to input the generator horsepower and hours of operation during the calendar year 2005. ***All the formulas are set to complete the calculations as the data is inputted. Therefore, do not move or change any of the fields or columns. If moved the results will be wrong calculations.*** A sample of the calculations are provided at the botton of Form 2.

FORM 4: Summary & Certification

A summarization of all the emissions by each pollutant will be listed within this form. All reports submitted to the Department should be certified true and accurate by the Responsible Official of the facility. This person is the owner or operator of the facility. **If there is a change of the Responsible Official of the facility, please notify the Department with an additional letter stating the change.**

The completed questionnaire should be submitted to the following address:

Arizona Department of Environmental Quality
Attention: Darlene Celaya, Emission Inventory Team
Air Quality Division, Compliance Section 3415A-3
1110 West Washington Street
Phoenix, AZ 85007

If you have any question or have difficulty completing this form, please contact Darlene Celaya at (602) 771-7662.

FORM 1: FACILITY GENERAL INFORMATION **YEAR 2005**

SECTION I: ***Plant Identification & Mailing Information***

Customer Name: _____

Place Name: _____ Place ID: _____

Mailing Address: _____ City: _____ State: _____ Zip: _____

County: _____

Phone: _____ Fax: _____

Permit #/LTF # _____ General Permit Yes □ No □

SECTION II: ***EI Contact***

EI Contact Name: _____ Title: _____

Telephone: _____ Fax: _____

SECTION III: ***Confidential Request***

Pursuant to Arizona Revised Statues §49-432 and §49-201, do you claim the Emissions Inventory data submittal confidential. If yes include which portions of the inventory are confidential along with a brief explanation:

Yes □
No □

FORM 2: EQUIPMENT, PROCESS & STACK DATA	YEAR 2005

Table 1: Equipment List

	Generator #1	Generator #2	Generator #3	Generator #4
Equipment ID				
ATO#				
Max. Rated Capacity				
Hours of Operation				

Table 2: Stack Information

	Stack #1	Stack #2	Stack #3	Stack #4
Height (feet)				
Diameter (feet)				
Velocity (feet/second)				
Exhaust Gas Temperature (F)				
Flow Rate (actual cubic feet per minute)				

Sample Emission Calculation: Emissions = $\frac{\text{Capacity (hp) x Hours of Operation (hrs) x Emission Factor (Pounds per hp-hour)}}{\text{2000 pounds per ton}}$

For a Generator of capacity 400hp and using Gasoline fuel and operated for 1500 hours during the year 2005, the emissions of Nitrogen Oxides (NOx) will be as follows:

Emissions = $\frac{\text{400 hp x 1500 hours x 0.011pounds per hp-hr}}{\text{2000 pounds per ton}}$ = 3.3 tons per year

FORM 3: EMISSIONS CALCULATIONS	YEAR 2005

	FUEL - GASOLINE				*FUEL - NATURAL GAS OR LIQUIFIED PETROLEUM GAS*			
	Generator #1		**Generator #2**		**Generator #1**		**Generator #2**	
	Max. Capacity (HP-hr) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP-hr) (4)	Operational Hours (hours/year) (5)	Max. Capacity (HP-hr) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP-hr) (4)	Operational Hours (hours/year) (5)
Pollutants	Emission Factor (3) pounds/hp-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/hp-hour	Emissions = (4)x(5)x(6)/2000 tons/year	Emission Factor (3) pounds/hp-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/hp-hour	Emissions = (4)x(5)x(6)/2000 tons/year
PM10	0.0007		0.0007		0.0001		0.0001	
PM	0.0007		0.0007		0.0001		0.0001	
CO	0.4390		0.4390		0.0029		0.0029	
VOC	0.0220		0.0220		0.0008		0.0008	
SOx	0.0006		0.0006		4.35E-06		4.35E-06	
Nox	0.0110		0.0110		0.0206		0.0206	
1,3-Butadiene	2.74E-07		2.74E-07		1.69E-06		1.69E-06	
Acenaphthene	9.94E-09		9.94E-09		-		-	
Acenaphthylene	3.54E-08		3.54E-08		-		-	
Acetaldehyde	5.37E-06		5.37E-06		7.10E-06		7.10E-06	
Acrolein	6.48E-07		6.48E-07		6.70E-06		6.70E-06	
Anthracene	1.31E-08		1.31E-08		-		-	
Benzene	6.53E-06		6.53E-06		4.02E-06		4.02E-06	
Benzo(a)anthracene	1.18E-08		1.18E-08		-		-	
Benzo(a)pyrene	1.32E-09		1.32E-09		-		-	
Benzo(b)fluoranthene	6.94E-10		6.94E-10		-		-	
Benzo(g,h,I)perylene	3.42E-09		3.42E-09		-		-	
Benzo(k)fluoranthene	1.09E-09		1.09E-09		-		-	
Butyr/isobutyraldehyde	-		-		1.24E-07		1.24E-07	
Carbon Tetrachloride	-		-		4.51E-08		4.51E-08	
Chlorobenzene	-		-		3.28E-08		3.28E-08	
Chloroform	-		-		3.49E-08		3.49E-08	
Chrysene	2.47E-09		2.47E-09		-		-	
1,1-Dichloroethane	-		-		2.88E-08		2.88E-08	
1,2-Dichloroethane	-		-		2.88E-08		2.88E-08	
1,2-Dichloropropane	-		-		3.31E-09		3.31E-09	
1,3-Dichloropropene	-		-		3.23E-08		3.23E-08	
Dibenz(a,h)anthracene	4.08E-09		4.08E-09		-		-	
Ethane	-		-		1.79E-04		1.79E-04	
Ethylbenzene	-		-		6.31E-08		6.31E-08	
Ethylene Dibromide	-		-		5.42E-08		5.42E-08	
Fluoranthene	5.33E-08		5.33E-08		-		-	
Fluorene	2.04E-07		2.04E-07		-		-	
Formaldehyde	8.26E-06		8.26E-06		5.22E-05		5.22E-05	
Indeno(1,2,3-cd)pyrene	2.63E-09		2.63E-09		-		-	
Methane	-		-		5.86E-04		5.86E-04	
Methanol	-		-		7.79E-06		7.79E-06	
Methylene Chloride	-		-		1.05E-07		1.05E-07	
Naphthalene	5.94E-07		5.94E-07		2.47E-07		2.47E-07	
Phenanthrene	2.06E-07		2.06E-07		-		-	
Propylene	1.81E-05		1.81E-05		-		-	
Pyrene	3.35E-08		3.35E-08		-		-	
Styrene	-		-		3.03E-08		3.03E-08	
1,1,2-Trichloroethane	-		-		3.90E-08		3.90E-08	
Toluene	2.86E-06		2.86E-06		1.42E-06		1.42E-06	
Vinyl Chloride	-		-		1.83E-08		1.83E-08	
Xylene	2.00E-06		2.00E-06		4.96E-07		4.96E-07	

FORM 3: EMISSIONS CALCULATIONS	YEAR 2005

	FUEL - DIESEL - LESS THAN OR EQUAL TO 600 HP				*FUEL - DIESEL - GREATER THAN 600 HP*			
	Generator #1		**Generator #2**		**Generator #1**		**Generator #2**	
	Max. Capacity (HP-hr) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP-hr) (4)	Operational Hours (hours/year) (5)	Max. Capacity (HP-hr) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP-hr) (4)	Operational Hours (hours/year) (5)
Pollutants	Emission Factor (3) pounds/np-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/np-hour	Emissions = (4)x(5)x(6)/2000 tons/year	Emission Factor (3) pounds/np-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/np-hour	Emissions = (4)x(5)x(6)/2000 tons/year
PM10	0.0022		0.0022		0.0006		0.0006	
PM	0.0022		0.0022		0.0007		0.0007	
CO	0.0067		0.0067		0.0055		0.0055	
VOC	0.0025		0.0025		0.0007		0.0007	
SOx	0.0021		0.0021		0.0073		0.0073	
Nox	0.0310		0.0310		0.0240		0.0240	
Acenaphthene	9.94E-09		9.94E-09		5.43E-06		5.43E-06	
Acenaphthylene	3.54E-08		3.54E-08		1.97E-06		1.97E-06	
Acetaldehyde	5.37E-06		5.37E-06		1.76E-07		1.76E-07	
Acrolein	6.48E-07		6.48E-07		5.52E-08		5.52E-08	
Anthracene	1.31E-08		1.31E-08		5.52E-07		5.52E-07	
Benzene	6.53E-06		6.53E-06		5.43E-06		5.43E-06	
Benzo(a)anthracene	1.18E-08		1.18E-08		1.76E-07		1.76E-07	
Benzo(a)pyrene	1.32E-09		1.32E-09		9.10E-07		9.10E-07	
Benzo(b)fluoranthene	6.94E-10		6.94E-10		6.46E-08		6.46E-08	
Benzo(g,h,I)perylene	3.42E-09		3.42E-09		3.28E-08		3.28E-08	
Benzo(k)fluoranthene	1.09E-09		1.09E-09		8.96E-08		8.96E-08	
1,3-Butadiene	2.74E-07		2.74E-07		-		-	
Chrysene	2.47E-09		2.47E-09		2.86E-07		2.86E-07	
Dibenz(a,h)anthracene	4.08E-09		4.08E-09		8.61E-09		8.61E-09	
Fluoranthene	5.33E-08		5.33E-08		2.82E-08		2.82E-08	
Fluorene	2.04E-07		2.04E-07		2.60E-08		2.60E-08	
Formaldehyde	8.26E-06		8.26E-06		4.35E-09		4.35E-09	
Indeno(1,2,3-cd)pyrene	2.63E-09		2.63E-09		1.07E-08		1.07E-08	
Naphthalene	5.94E-07		5.94E-07		7.77E-09		7.77E-09	
Phenanthrene	2.06E-07		2.06E-07		1.53E-09		1.53E-09	
Propylene	1.81E-05		1.81E-05		1.80E-09		1.80E-09	
Pyrene	3.35E-08		3.35E-08		2.90E-09		2.90E-09	
Toluene	2.86E-06		2.86E-06		2.42E-09		2.42E-09	
Xylene	2.00E-06		2.00E-06		3.89E-09		3.89E-09	

FORM 4: SUMMARY & CERTIFICATION	YEAR 2005

Total all the emissions for each pollutant and enter in the table below.

Pollutant	Tonnage (tons per year)
Particulate Matter (PM)	
Particulate Matter Less Than 10 Microns (PM10)	
Nitrogen Oxides (NOx)	
Sulfur Oxides (SOx)	
Volate Organic Compounds (VOC)	
Carbon Monoxide (CO)	
Hazard Air Pollutants (HAPs)	

Certification of Truth & Accuracy

I certify that I have knowledge of the facts set forth in this questionnaire, and that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Arizona Department of Environmental Quality as public record.

Signature of Responsible Official: _____ Date: _____

Print Name: _____

Title: _____